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ABSTRACT

Previous research has suggested that extrinsic rewards operate to decrease intrinsic motivation to perform a task when they are offered for an initially intrinsically motivating task and then removed. To determine the initial intrinsic motivation of studying, 170 Canadian community college students were divided into one control and four treatment groups: announced and unannounced rewards, and skill or chance directions. Data from questionnaires measuring locus of control, learning motivation, meaning and value of work, and teacher and course evaluations were analyzed. The results indicated that intrinsic motivation and locus of control were related but not sufficiently to predict academic achievement. Although the predictor variable (meaning of work) failed to achieve significance, the findings suggest that future research on students' meanings of work in predicting academic performance seems promising. (Author/JAC)

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The Effects of Student Meanings and Values of Work on Intrinsic Motivation and Subsequent Student Academic Performance.

BY

Gilles L. Talbot

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Appendices 1 and 2 available from author.

THE EFFECTS OF STUDENT MEANINGS AND VALUES OF WORK ON INTRINSIC MOTIVATION AND SUBSEQUENT STUDENT ACADEMIC PERFORMANCE.

BY:

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DEDICATION:

To the memory of my Father, Paul Eugène, who firmly believed that education is a royal road to self-actualization.

To all Cegep students, in the hope that someday they may all be self-actualizing.

Abstract

170 students in one control and four treatment groups —— Announced or Unannounced Rewards, and Skill or Chance Directions —— were administered, at mid-semester, questionnaires to assess Locus of Control, Learning Motivation, Meaning and Value of Work, and Teacher and Course Evaluations. These results were analyzed to determine the relationship between intrinsic motivation and meaning and value of work scores to help design an operant reinforcement strategy based on these meanings and values, to enhance academic performance of students who were failing at mid-term. Results indicate that intrinsic motivation and locus of control are related but not sufficiently powerful to predict academic achievement. Intrinsic motivation,wihtout any consideration of locus of control, and the use of student meanings of work went from a p of 0.61 at mid-term to a p of 0.078 at the end of the term in predicting academic performance for all students. Although the predictor variable (meaning of work) failed to achieve significance (p. 0.078),the author concludes that future research with the student's meaning of work in predicting academic performance is warranted and appears promising.

THE PROBLEM:

THE PROBLEM:

Delimitation of the Problem:

Could extrinsic rewards and exogenous reinforcements operate to increase motivation? According to Festinger (1957), Deci (1975), and other motivation theorists (Harlow,Harlow & Meyer,1950; DeCharms,1968) extrinsic rewards operate to decrease intrinsic motivation to perform a task when they are offerred for an *initially* intrinsically motivating task and then removed.

If the task at hand is academic achievement motivation, then one may ask: "Just how *initially* intrinsically motivating is it to study?"

This question stirs up once more the Nature versus Nurture controversy. We have Nativists arguing for innate factors at one extreme, and Behaviorists arguing for environmental influences at the other extreme. Then again there are compromise theorists contending that the two views are not diametrically opposed. They maintain that both views represent adequate interpretations *at different times of development.*

It is important for us to consider these three points one-at-a-time because collectively they lead to a major research construct that leads to the statement of the problem.

The presentation of exogenous reinforcements and extrinsic rewards may then drastically alter intrinsic academic motivation. Deci (1975) in reviewing the implications of intrinsic motivation for education sums up as follows the Nativists' point of view:

> The conclusion from all these sources seems clear. Children are intrinsically motivated to learn; the activities of learning and discovery are rewarding

> in their own right because they allow a child to feel competent in relation to his environment. The use of rewards or punishments to encourage this learning will only interfere with the learning because it will make the child's learning dependent on the reward and cause him to do things that will lead him to the rewards in the easiest way. This, in turn, will undoubtedly leave him having "learned" less.
>
> (Deci, 1975; page 212)

The grade earned would then take on probably more significance than the material learned. This is an observation that is all too frequent in Cegep. There is something drastically wrong when a student can proudly affirm: "I got a C ; but I didn't learn that much."

The Behaviorists argue that rewards and reinforcements are highly conditioned states that have been internalized through classical and instrumental conditioning and which *appear* as intrinsic motives. In the strongest behavioristic tradition, they argue that intrinsic motivation is a complex and *initially external state* that has been acquired through higher-order conditioning.

> What we are concerned with here, is the entire concept of intrinsic motivation, and it will be our position that the concept, as usually stated, is essentially wrong and misleading. What appears to be intrinsic motivation, we contend, is often either (1) extrinsic motivation, or (2) a conditioned consequence of a history of extrinsic motivation. The latter statement does not contradict the existence of intrinsic motivation, but gives a very different interpretation of how it develops.
>
> Let us deal with the second point first, as it conceptually is the simpler of the two. It is clear that reinforcement of a behavior makes that behavior "habitual," though not invulnerable to change through extinction. We would propose that the student who studies hard is typically a product of a fortunate reinforcment history. Two things are necessary for

> such a behavioral development. First the student must, at least occasionally, have done some things well. Second, he must have been noticed, praised, and perhaps otherwise rewarded for his successes.
>
> We must summarize the point very clearly: We refer here to "good habits" that are maintained by the reinforcement history, *independently of expectations* of rewards or successes. Obviously such expectations often exist concurrently, but the underlying habit strength is what we are referring to. Once good academic habits are established through reinforcement, a continuing intermittent schedule of reinforcement is all that is necessary to keep extinction of the behavior from occurring.
>
> (Vernon,1972;page 282)

Failure to perform to criterion or abandoning courses is seen as the result of not having received sufficiently large or frequent rewards. The student does not perceive and experience sufficient amounts of reinforcements to continue investing his resources.

The compromise theorists accept the possibility and probability of an innate capacity for developing intrinsic motivation based upon appropriate environmental stimulation (rewards and reinforcements). This functional behaviorism is based on the concep- that it is not *how* the individual is stimulated, as much as *when* he is stimulated, that leads to the acquisition of intrinsic motives.

Once more this opens the door to another major division within psychological thinking --- the stages versus period development theorists. Our interest here is not on whether there are such relative (stage) or absolute (period) times of development. We defer to the Review of the Literature a close examination of the question on the relevance of the timing of the development of intrinsic motivation in the individual. We are interested

in knowing if there are times when intrinsic motivation is most susceptible,and hopefully amenable in some cases,to changes.

Newman and Newman (1975) in their review of the literature on the relationship between the time of development and the occurrence of academic achievement motivation support the Behavioristic model. They maintain "...that parental child-rearing practices make an impact on the development of the achievement motives which can be clearly identified by the time the child is middle school age.(8 thru 11)" (Newman & Newman,1975;page 170) This would support the period concept in the development of academic motivation. However, as Newman and Newman stated "...to the conception of the motivational profile we must add a conception of the situation " (1975;page 169). This clearly supports the behaviorists and also a stage concept of development. Newman and Newman put it this way:

> In addition to the finding that achievement motivation is a relatively enduring characteristic of personality, research has also found that the achievement motive is aroused in situations which demand competition against a standard of excellence, where there is a strong emphasis on the importance of high-quality performance, and where there are psychological penalties for failure.
>
> (Newman & Newman,1975;page 171)

This leads us to conclude that environmental situations emphasizing skill ("high-quality performances") and meaningful psychological rewards and punishments, as occur in the development of self-concept, would arouse academic achievement.

From all this, our concern is with the implications of the management or mismanagement of extrinsic rewards and reinforcements in developing

intrinsic motivation. It seems to follow that if a professor were to add meaningful rewards and reinforcements in teaching students, intrinsically motivated to various degrees, and at the appropriate time of the individual's development then academic performances, as a manifestation of achievement motivation ought to be increased.

First, the problem is to determine the nature of "meaningful" rewards and reinforcements to use. Second we have to differentiate exogenous from endogenous reinforcements and to explain how the latter may be learned from the former. Third, we need to explain theoretically and operationally the nature of extrinsic versus intrinsic motives as they relate to *academic* achievement motivation. Fourth, how do we go about creating possible situations in the environment that would arouse intrinsic motives of students.

Of considerable importance for a succinct statement of the problem are the first and fourth questions. The other two questions are discussed in Chapter Two.

Achieving "Meaningfulness":

Would sufficiently large extrinsic rewards and exogenous reinforcements affect intrinsic motivation if they were based on the stated preferences of the students as opposed to being inferred and assigned by the teacher ?

It is assumed that within the pedagogical process the distribution of rewards and reinforcements is a mutual affair between professor and student. The student is expected to be motivated by the possibility of earning higher grades, and to perceive the course as a means to an end. Professors reinforce those student behaviors congruent with this belief and rewards them with

grades and social reinforcers (praise, attention, recognition, approval).

Administrators and professors argue, to support this view, that much attention has been given from the very beginning to provide for a dedicated and competent professorial staff. Two of the founding principles of the Cegep are often interpreted as proof: 1) Cegeps rely on competent professors to teach students who are *willing* and able to learn, and 2) Cegeps exist to provide a uniform and coherent stabilizing influence to normalize the quality and extent of information in post-secondary education.

Further the administration, with support from the professorial body, maintain that well-intentioned and competent faculty with available support staff and facilities cannot *make* students learn. Meaningful rewards and reinforcements are the responsibility of the student. It is up to the student to motivate himself.

There is no doubt that the student, by his presence in Cegep, is in some aspect motivated to study. But can we afford to assume that the operation in such a narrow perspective on rewards and reinforcements increases learning motivation ?

One notices that in the formulation of the founding principles for collegiate education, the student's perceptions of the professor and of the course are not taken into account. There is much evidence in Social Psychology (Martin,1974) to suggest an interaction between model (professor) and observer (student) to affect learning motivation. Could student determined rewards and reinforcements, as evaluated and applied by the professor from the student's expressed meanings and values, affect his academic achievement ?

Implicit in this discussion has been the idea that the student will develop expectations for successes or failures. These expectations may be

thought of as having probabilities and values. The nature of the teacher and the course affect the students' expected probabilities to pass or to fail. The student's perceptions of the teacher and the course provide him with the value of such expectations. The interaction between these two is explained with the aid of this example. There are teachers known to students to be stringent with grades but highly competent. Then again there are teachers known to students to be generous with grades but reputed for anything except their competence. The student's probabilities and values for success will be central in determining if he wants an easy grade with little learning, or learning with a stringent grade. The former represents a low level of probability for developing competence in the student and a high value for any effort. The latter represents a high level of probability for developing competence in the student and a low value for any effort.

The teacher also has expectations. One of these is that he expects students to comply to his expectations to obtain academic achievement. The solution appears again to be a compromise. The teacher should maintain sole responsibility in setting expectations for material related to academics. Course content, testing schedule, assignments etc. would still remain the domain of the teacher, and his expectations that they be done to a criterion level (passing grade) would still reign. However, his expectations or probabilities and values for delivery of these academic goods should at least reflect the student's expectations. Rosenthal and Jacobson (1966) have quite dramatically shown that teacher's expectations may be absorbed by children to the point of significantly contributing to positive IQ changes.

In effect, we are advocating that student's will come to accept our expectations for academic success, if we learn to respect and attempt to

relate to their expectations about teachers and courses.

The student makes use of expectations and perceptions which we are currently ignoring. We need to make teachers aware of the necessity to prepare meaningful rewards to reinforce desired *and* academic behaviors.

Politeness, being seated properly, raising one's hand to ask questions etc. are examples of desired classroom behaviors. Completing assignments on time, active class participation, trying to learn from one's mistakes are examples of academic behaviors. Desired classroom behaviors may be integrated with academic behaviors (e.g. politeness and class participation). On such occasions the use of academic credits to reinforce desired and academic behaviors ought to weigh in favor of the participation. The judicious use of social reinforcers may be used to reinforce the politeness. Such differential reinforcements would facilitate overall social development and help the student discriminate stimuli and responses that contribute to academic achievement.

Primarily, the student comes to class to develop his intellectual capabilities. This doesn't mean that he temporarily sets aside his other needs (social, emotional and physical). The Meaning and Value of Work Scale (MVWS) by Kazanas (1975) provides us with a valid and reliable instrument that is quickly administered and scored. It is very probable that it may help professors capitalize on these hereto unused student meanings and values.

There is every indication to believe that using *student* determined meanings and values of work, for scheduling and adminstering rewards and reinforcements in the classroom, could help professors increase the student's performances.

> ...(T)he teacher must be sensitive to the child's dominant motives. He must be able to present tasks that represent a range of difficulty levels and to structure a variety of learning situations (achievement oriented,relaxed) so that all children may have

> some opportunities to experience success. The student, his parents, and school personnel may have to accept the fact that the child will perform better with some teachers than with others.
>
> (Newman & Newman,1975;page 174)

"Some opportunity for success" may be a crucial factor in academic achievement as Feather & Saville (1967) report. We cannot ignore the importance of experiencing success because failures and abandons may lead to lower student expectations or probabilities of success to perform to criterion. In other words, failures may lead to still other failures.

Arousing Situational Academic Achievement:

As we have seen, the use of meaningful rewards and reinforcements may create an external situational force sufficient to help the teacher arouse academic achievement. Once the situational force has been applied we would like for the student to become fairly independent of the teacher or external locus of control in favor of a personal or internal locus of control.

In Chapter Two we will examine the theoretical constructs and experimental research in support for the Locus of Control construct. Suffice it to say here that locus of control is significantly related to intrinsic-extrinsic motivation and academic achievement. Of equally great importance is the fact that Internal - External Locus of Control is amenable to change in the desired direction based upon the judicious use of rewards and reinforcements.

We have accepted the compromise point of view that intrinsic motivation is related to the situational and temporal influences. As will be shown in

Chapter Two the Locus of Control will serve to vehiculate the rewards and reinforcements from other (teacher) to self (student) administered. That is, as the student experiences success, and gains greater control over the influences in his life, he will want to gain control over these forces or at least gain sufficient control to have the rewards and reinforcements administered by others consequent to his behavior. This is abundantly documented in the literature on the use of operant conditioning principles in the classroom (Lipe & Jung,1971).

We may now address ourselves to the temporal influences on intrinsic motivation. That is, when are such rewards and reinforcements most probably going to lead to valued intrinsic motivation ?

The research work by Rosenthal and Jacobson (1966),extended into book form (1968), provides an important clue as to when to take account of student meanings and values beyond the 8 thru 11 age range.

This team of psychologists were supposedly doing research affiliated with Harvard University to predict intellectual development. The "Test of Inflected Acquisition", which was actually an ordinary IQ test, was administered to a group of elementary students. Teachers were given bogus information about potential IQ development for several of their students. The teachers were led to believe that these "spurters" would develop significantly higher IQ's. An IQ test administered at the end of the school year revealed that these children had indeed gained in IQ. Rosenthal and Jacobson proposed that teacher expectations were communicated to students who changed their self-concept to accommodate the difference between their self-perception and the perception others held of them.

The important clue is that self-concept changes in relation to expectations. We have been presenting arguments for instilling meaningfulness and responsibility in Cegep students for their academic achievement. This is where the total picture comes into focus. We can learn to use the student's expressed meanings and values to help teachers *expect*, reward and reinforce academic achievement behaviors. The personal growth of a student as a function of the input into a plan he helped design can only lead to participative education. At such time education is transposed from the passive model of the professor preparing a lecture for students to hear, to the active model in which the student is prepared to listen to the lecture.

The difference between the student's academic behaviors (if not up to his full potential) and the expected, rewarded, and reinforced behaviors from his professor will force the student to alter his self-concept to align with a more meaningful and responsible behavior.

The optimal time for such a process is in Cegep with late adolescents and young adults (16-20). This time in their lives is especially conducive for such soul-searching because students are progressing through the critical stages of forming an identity or self-concept. Newman & Newman clearly reflect this position:

> The process of identity formation within the college environment is likely to be heavily influenced by the relative emphasis on education as a means of raising questions and searching for answers or education as a means of developing occupational competence.
>
> (Newman & Newman,1975;page 247)

Avanzini and Ferrero (1976-77) have successfully used an approach called the Freinet Method which is similar to the idea of developing the self-concept to increase academic achievement. They advocate that the teacher be viewed as a guide to help the student discover the truths and facts of life rather than as one who promulgates the acquisition of a body of facts.

The Nativist position would also be in favor of such a procedure as Deci (1975) writes:

> If schools insist on having children learn (or more realistically, memorize) certain things, then they may have to use extrinsic rewards. Otherwise kids probably would not do many of the things which they are told they have to do in schools. This, however, raises a larger question and one which is more a question of values than science. "What is it that we want schools to be doing ?" Do we want children memorizing a host of different facts and operations ? If that is important, we will probably have to use extrinsic rewards. However, as numerous writers such as Bruner and Holt have pointed out, they will probably forget most of that, anyway.
>
> On the other hand, if we are interested in having them develop viable cognitive structures (Bruner,1962) which relate meaningfully to the rest of their lives, then intrinsic approaches to learning are preferable.
>
> (Deci,1975; pages 212-13)

This compromise position for motivating students does justice to both the Nativist and Behaviorist points of view. In closing, we agree with Batson and Johnson (1976) that the contributing factor in motivating students is challenging them to understand themselves and the society in which they live.

THE PROBLEM:

Statement of the Problem:

In compiling the descriptive statistics for students failing or abandoning courses in psychology, we noticed that these data were not available on a departmental, collegiate, or Cegep-wide basis. A routine check with the Québec Department of Education revealed that none had expressed a need for descriptive statistics of students failing or abandoning (Duval, 1979). In so doing, we have been neglecting a source of valuable information that may shed light on wasted human potential.

Of the nearly 660 students currently enrolled in our Cegep we can expect, based on the normal probability curve, that approximately 16 would fail due to inadequate intellectual capability.

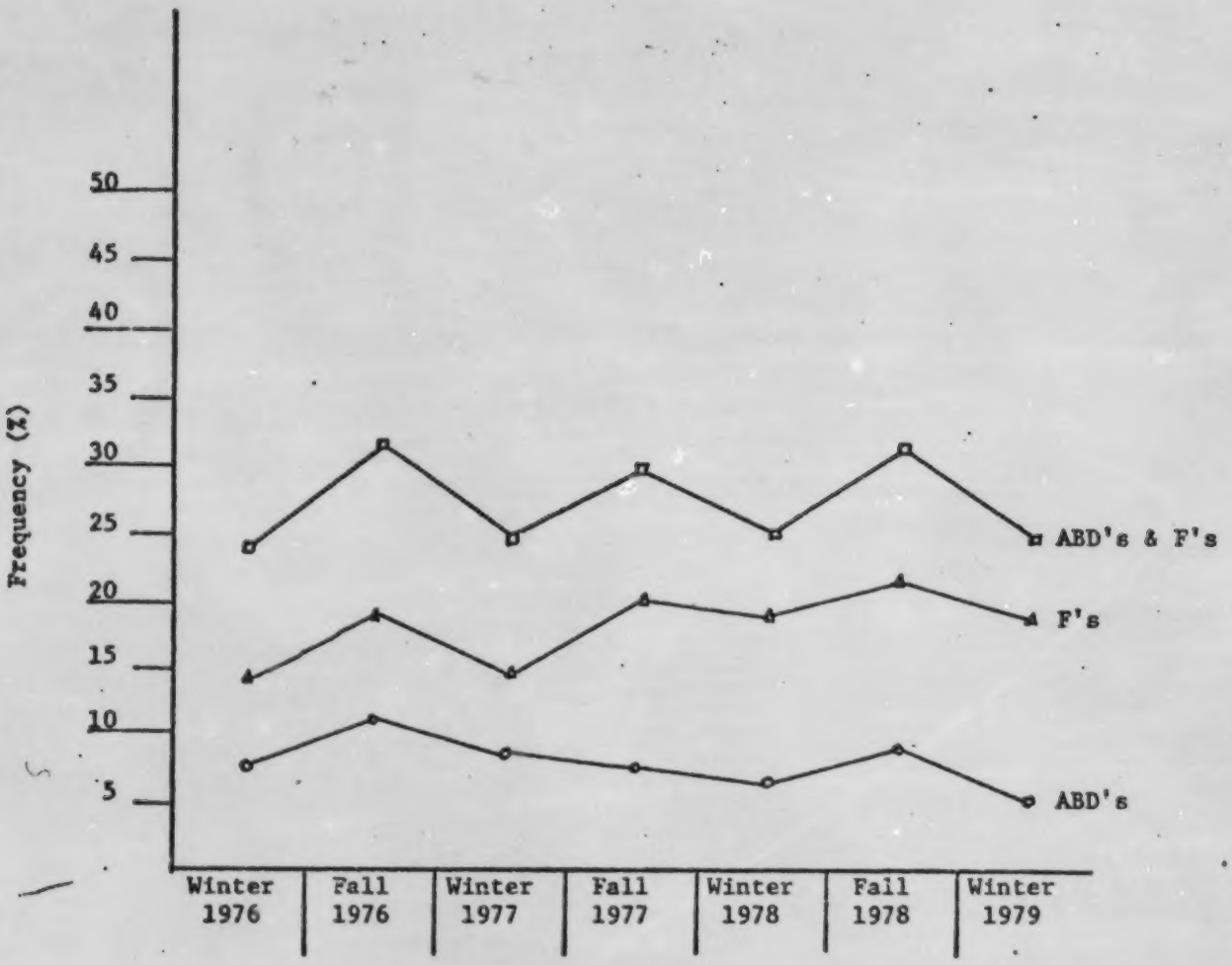
An in-house survey disclosed that at our campus there existed a significantly greater number of students failing (see Figure 1). Since the Fall of 1977 Failures (F's) have been nearly twice as frequent as Abandons (Abd's) That is,the trend is for abandon rates to decrease while failure rates increase. It seems improbable for such failures and abandons to have resulted solely from the intellectual incapacity of students.

We would like to digress here for a few brief paragraphs to expose a problem that could be easily solved now.

Computerized records on descriptive statistics of students failing or abandoning courses would allow for a more systematic and efficient search for their cause(s) because of:

1) multiple correlation matrices that could be calculated to determine predictor variables,

FIGURE 1.



Abandon (ABD) and Failure (F) percentages for Champlain Regional College - St. Lawrence Campus from January,1976 through May, 1979.

2) several multiple regression equations that could be varied systematically according to the predictor variables derived from multiple correlation matrices,

3) systematic experimental investigations of variables derived from multiple regression equations.

That is, we could make use of data currently discarded, to select variables that may contribute to predicting academic achievement. Expenditure of time and effort could then be shifted from guessing at variables and performing routine analyses, to formulating theories capable of explaining factors, and hence ultimately predicting changes necessary for increasing academic achievement.

Computer facilities and competent personnel already within SIMEQ* and the Cegep network makes this feasible and highly productive. The analysis of this descriptive bank of data would in itself be productive for counseling within Cegeps. Probably the greatest advantage would be derived from having teachers participate in the on-going research to ensure the application of results and to provide continuity in a concerted effort to curb abandon and failure rates.

The major disadvantage is of course the operating budget. There are two major reasons though to argue against the cost. First, computer technology is one of the very few fields that continues to improve and decrease in cost. Hence the overall expenses of computer operation, which is currently underused, actually decreases with increased use. Second, according to the Ministère d'Educaton du Québec (1978) it costs approximately $340.00 per student per failure or abandon. Obviously, several million dollars are wasted each year when far too many students fail to avail themselves of the opportunity

SIMEQ Système d'Informatique du Ministère d'Education du Québec

of a Cegep education.

The relative difficulty and the inefficiency of the trial and error approach to select predictor variables, in the absence of these descriptive statistics, led us to select a representative versus systematic design. The latter is preferable because of the information gained from a study of the systematic variations of several predictor variables on behavior.

In order to most efficiently study such predictor variables we had to identify several possible classes of variables operating in the classroom. Furthermore,we neededto calculate the relative weights (α & β coefficients) of these variables contributing to academic achievemcnt (criterion or dependent variable). This necessarily led us to study correlation coefficient matrices and possible significances between classes of variables generally known to be related to classroom academic behaviors. Since we are interested in increasing student academic achievement, then teacher and course effects were obvious choices. We wished to determine if professor and/or course characteristics interacted with student learning variables to affect academic achievement.

It also seemed that student perceptions of rewards and reinforcements, as determined by others for use in the classroom differed from those that were self-determined. Succinctly, we wished to examine student determined rewards and base our reinforcement on these, to determine their effect on academic performances.

The statement of the problem may be formulated as follows:

Are the student's reported meanings and values, as used by the professor to increase the student's responsibility and identity, sufficiently powerful

and useful to enhance academic achievement? Further, is it significantly better to use an Announced or Unannounced approach with attributions for success or failure based on Chance or Skill directions?

Review of the Literature

Theoretical Constructs:

To arrive at an adequate formulation for academic achievement motivation requires that we examine two central concepts: Drives and Reinforcers.

A drive is a theoretical construct that extends and evaluates behavior from purpose to goal direction. The current trend in motivation is to differentiate between the action and the reinforcer or incentive quality which may be positive or negative and large or small. A drive is that which prompts one to action regardless of the quality or magnitude of the reinforcer or incentive that the action leads to. That is, behaviors are initiated for their own sake without expectation of obtaining rewards.

In operant conditioning a reinforcer acts as a motive if it increases the magnitude or frequency of behaviors because such behaviors are contingent to obtaining the incentive. A reinforcer in classical conditioning also acts as a motive if the expression of a probable and reinforcing behavior, leading to a reward, is continually paired with a less likely behavior. The organism eventually learns to expect that the lower probability behavior will lead to the reward or part of the reward. Either conditioning technique stresses that expectancies of reinforcement will develop. These expectations lead to behavior based upon the perceived magnitude and quality of the incentive.

What roles do drives and incentives play in explaining insufficient academic achievement motivation? Could students be driven to failure? Could students be driven to fail because of a fear of success? Could students fail because they are not motivated by reinforcements? Could students fail because

reinforcements adversely interact with their drives (intrinsic motives)? Finally, could students fail because they are not able to perceive and hence expect reinforcements? In a systematic review of the literature we hope to find the answers to these questions.

Other obvious questions are related to the student's responsibility and self-esteem. What is the relationship between responsibility and academic achievement? Even further, what is the relationship between causality and academic achievement? Both of these questions have been examined in the literature and are technically referred to as Internal versus External Locus of Control or Causality. Research on the relationship between Locus of Control and academic achievement will be closely examined for indices to solving our problem.

Others may argue that student dignity, pride, and self-concept must certainly play a part in explaining the student's academic achievement. What roles do self-esteem and self-concept have in explaining a student's insufficient academic achievement motivation?

So the, the review of the literature is unified around three central themes: Drives and Reinforcements, Locus of Control, and Self-Concept. This theoretical perspective will enable us to examine the characteristics of the Cegep and the Student as they relate to his quest for an education. Figure 2 represents the theoretical framework which we believe represents the major elements interacting to produce academic achievement or learning motivation. We will establish that the student's perceptual process plays a central role in relating reinforcements and locus of control to his self-concept which becomes the theoretical link between drives,incentives, responsibility and academic achievement.

FIGURE 2

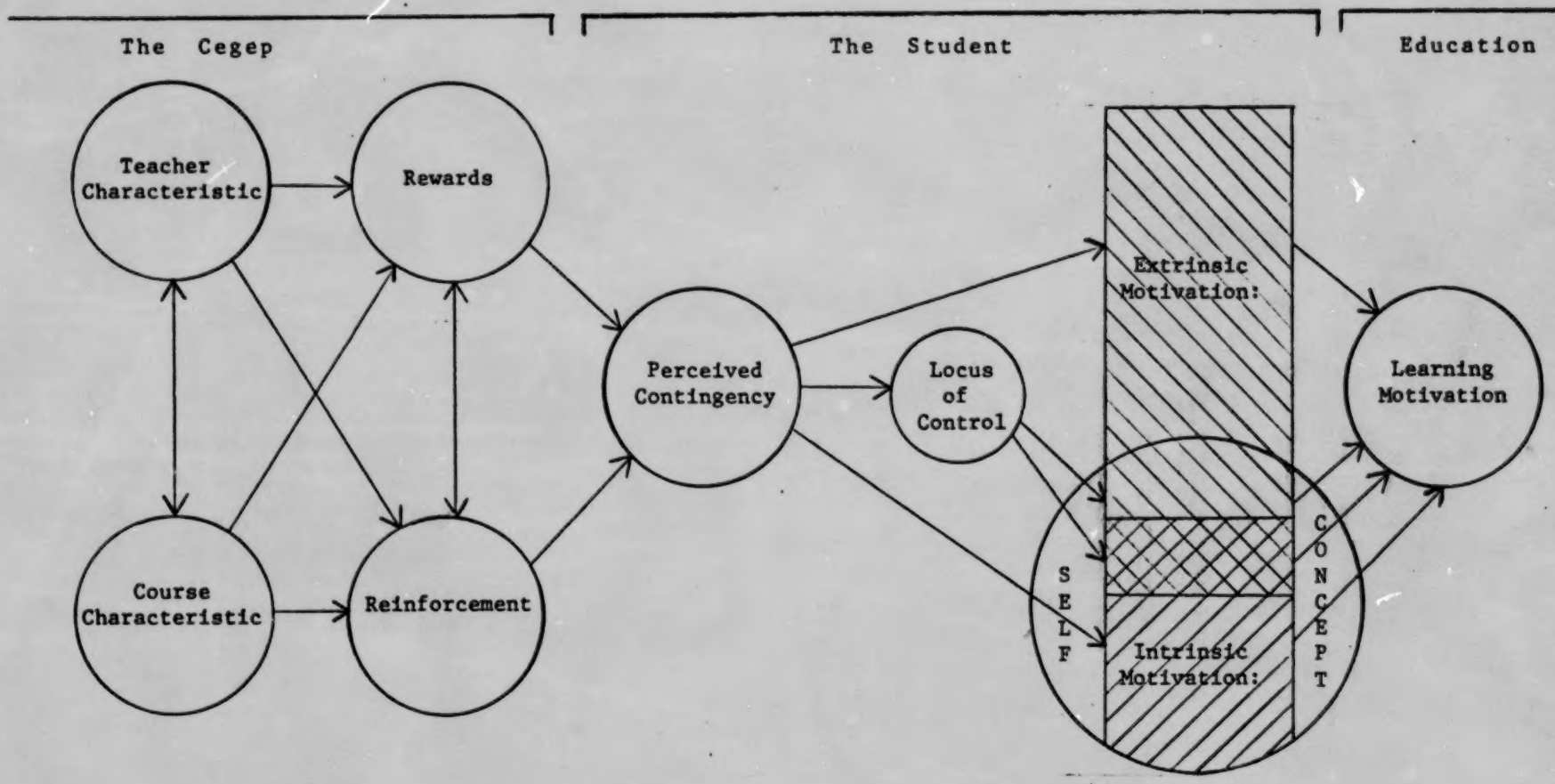


Figure 2 The interaction between Cegep efforts to give an education and student motives to earn an education.

Academic Achievement: Drives and Reinforcements.

Drives as they relate to the educational system are used to explain the student's desire to learn for learning's sake. Drives may also explain that he learns to help answer the many questions he formulates about himself. In referring to Figure 2, we can understand that a student driven to learn follows one of four routes. He attends Cegep where the interactions of teacher and course characteristics and rewards and reinforcements lead him to ask himself some questions about the meanings and values he holds for people, objects, and situations. If these values have been chosen for him by others,such as parents and he doesn't challenge this process, he will take the extrinsic motivation route without ever allowing his self-concept to be involved. This is a foreclosure on identity development and may be thought of a negative self-concept. This student most likely values and derives meaning from what he is or what he will be.

At the other extreme the student perceives much personal meaning and value. This leads him to be highly intrinsically motivated to learn because it contributes significantly to the development of his self-concept. This is as nearest to an identity achieved student,or person with a highly positive identity, as we can get in an educational institution. This student values most, and derives greatest meaning from, knowledge and learning about who he is or who he will be.

Other students are driven to consider their meanings and values in relation to those people and situations they perceive responsible for such cognitive and affective states. They haven't yet made up their minds about this relationship except to admit that they know and feel that it is they who are "stuck" with this problem. That is, they don't know or feel they know

what or who they are. These students are diffused or in a moratorium state.

Let us now proceed to examine if any of these students may be said to be truly driven to study. The identity foreclosed students are motivated to please significant others,usually parents, to cede to peer pressure ("All the guys are going to Cegep.") or to gain the skills that they believe are related to "success," "status," "power," "wealth," etc. None of these states are innate. They all rely on other persons or situations to motivate them. These are behaviors related to expectations and are therefore not motivated by drives but rather by reinforcements. We will take up this discussion again in the section on reinforcers.

The identity achieved student might be so overwhelmingly involved with developing his self-concept that he may be indifferent to grades. We might expect then that he could be driven to fail. Waterman and Waterman (1972) have shown that "achievers" or ego-identity status students that leave school do so on good academic standing. If such students are driven to extremes to develop themselves, they are likely not to be the ones with poor academic performances.

Students with an identity diffused or in a state of moratorium, most likely attend Cegep in the hopes that this experience will help in two ways: They hope to discover who and what they are by learning roles. Then again they think the Cegep experience will help them to be more personally and socially adequate and acceptable through the acquisition of nonverbal and verbal skills. They are driven for a variety of personal and social needs. However, they attend Cegep with the expectations that the experience will provide them with an opportunity to meet some of these needs. We are led

to conclude once more that these students are reinforcement motivated and not driven to acquire an education.

We can conclude then that there may be some students who are driven to attend Cegep. However, the group of students from which failures or abandond are likely to arise are reinforcement motivated. A position that supports the Behaviorists' assumptions that intrinsic motives are learned through classical and/or operant conditioning.

Why do some students apparently develop drives, while most develop reinforcement needs for academic achievement? The answer to this question is more appropriately studied in the context of parent child-rearing practices that lead to responsibility, competence, and need achievement. Consequently we defer our discussion to the section on Locus of Control.

We proceed to examine the effects of reinforcers on academic achievement. Lipe and Jung (1971) have reviewed the literature on "Manipulating incentives to enhance school learning." Based on this review we are led to conclude that the student is examined within a strict drive motivation model. The students have been exposed to a series of reinforcers in single and combined effects,and then have had their academic performances examined to assess the effects of such reinforcers. This has led to an excess of unorganized classroom management principles. This exhaustive report reveals that operant technology programs or contingency management efforts have not taken into account such essential factors as development of autonomy, locus of control, and self-concept in relation to academic achievement.

Martin (1974) in an effort to produce a "Learning theory of college teaching" reviewed the literature on contingency management courses. "Specifically two phenomena have been typically observed: the dropout rate in contingency management courses is relatively greater than it is in 'traditional' college courses; and a meaningful number of students fail to reach

criterional performance in such courses" (page 1).

Schilling (1977) has shown that rewards in themselves may no be the problem. Rather it is the appropriateness of their application in a given situation. Where rehearsal and memory are a significant part of the learning situation, reinforcements related to the final grade are important and effective. Where the student is expected to generalize to other situations and events the material he has acquired in the classroom,reinforcements grade or non-grade related have a negative effect (Bebeau,1977). This is due to the interaction of several variables: extrinsic-intrinsic motives, attribution and expectations for success or failure, and reinforcement history.

Academic Achievement: Extrinsic-Intrinsic Motives:

Balance theory (Heider,1946) was the earliest attempt to represent cognition-sentiment relations by explaining the relationship between persons and objects, when one assumed the person's perspective and explained the process in terms of the person's cognitive categories. This phenomenological approach was elaborated by Heider (1958) as The Psychology of Interpersonal Relations. Although Heider was primarily interested in studying interpersonal relations, there was an implicit assumption that the values, roughly equivalent to his sentiment relation concept, contained elements of intrinsic motives or interest.

Festinger's A Theory of Cognitive Dissonance (1957) proposed the process of cognitive "trade-offs" to restore consonance or balance that occurred as the result of actions and choices that created dissonance or imbalance. This was clearly a statement of relationship between an intrinsic (choice) and an extrinsic (action) factor.

The suggestion that extrinsic rewards affect intrinsic motivation or personal causation was explicitly stated by DeCharms (1968).

> If we assume, however, that a major factor in the intrinsic dimension is the desire for personal causation then intrinsically motivating tasks are those in which the person feels that he is in control, that he originated the behavior (as an Origin) with the concomitant feelings of free choice and commitment. Introduction of extrinsic reward however, places the person in a dependent position relative to the source of reward. To the extent that the person expects a reward for his task, he is unfree and has not chosen the task for its sake alone. The source of the reward in an external causal locus for his behavior. When rewards are important, dependence on the source of reward places a person in the position of a Pawn.
>
> (1968: page 329)

This clearly supports the point we have thus far elaborated with regards to the use of reinforcement theory in the classroom. However, DeCharms continues ---

> With regard to intrinsically preferred tasks, the addition of extrinsic rewards may reduce task motivation rather than enhance it. The motivation to perform a task undertaken originally as a result of the desire to demonstrate causation will suffer if an extrinsic reward is offerred for task accomplishment.
>
> (1968: page 329)

This is a serious challenge to reinforcement technology which necessitates very close examination. In terms of actual experimental work, Harlow, Harlow, and Meyer's (1950) research, which led to the famous manipulation drive postulate, is the logical departure point for studying the effects of extrinsic rewards on intrinsic motivation.

In this classic study, eight monkeys played with a puzzle without any apparent extrinsic reward. An experimental or reward group was formed with half of the monkeys. The other four monkeys formed the control or non-reward group. As expected, the rewarded group <u>increased</u> their performance.

However, when the reward (a raisin) was no longer available performance not only decreased but fell significantly below that of the control group which continued "playing" with the puzzle. Harlow et al. concluded that this continued play was the basis for a manipulation drive. Recent researchers would point out that these control-group monkeys could be more appropriately referred to as intrinsically motivated. Further, it may also be argued that the introduction and consequent removal of an extrinsic reward decreases intrinsic motivation.

Deci (1971) reported the first published study on the effects of extrinsic rewards on intrinsic motivation. SInce then, others have attempted to delimit the factors related with extrinsic rewards and intrinsic motivation that could explain the proposals outlined by Heider and Festinger, and stated by DeCharms. Our particular concern is academic achievement motivation and evaluating the effects of extrinsic rewards on intrinsic academic achievement motives. Deci (1975) proposed that we develop specific intrinsic motives, such as a achievement and actualization from our innate and therefore earlier undifferentiated needs for competence and self-determination. All needs, according to Deci, become differentiated as a result of interaction with the environment. This is very much the view of cognitive development that Piaget advances. Accordingly Deci cites the work of Piaget and his colleagues to establish a parallel theoretical framework for the development of intrinsic motivation and for the intrinsic motivation of development .

Deci (1975) thus acknowledges that intrinsic motives are innate and become differentiated through the reinforcement history of the individual. It appears that the principles of stimulus generalization and discrimination, and response generalization and discrimination, which are central concepts in reinforcement theory, are mediational variables between intrinsic motivation and academic achievement.

Deci (1971) caused quite an uproar when he presented experimental evidence that introducing extrinsic reinforcements, and then removing them, produced negative consequences on intrinsic motivation. In such experiments (see Deci,1975) subjects are free to choose a puzzle of some type. The amount of time these subjects spend in attempting to solve these puzzles is reocrded as the data for the unrewarded and intrinsically motivated condition. Later these same subjects,with similar puzzles are offerred extrinsic rewards for performing the same tasks. In a third follow-up session, subjects are again observed as in the first session. Researchers record the amount of time the subjects' spend playing with the the puzzles. There are always significant reduced time differences which are interpreted as evidence that the intervening extrinsically rewarded session adversely affected the subjects' intrinsic motivation. Obviously, if such conclusions are valid and reliable, they pose a serious threat to the use of reinforcements for academic achievement motivation. So long as there would be someone there to administer rewards things would be fine. If however, there were no reward-persons available, the student's intrinsic motivation would be diminished for as much.That which we are trying to increase would be seriously decreased. However, there are four major difficulties with this type of research.

First, there is the question of the adequacy of generalizing from relatively simple puzzle-solving behavior to the highly complex behavior in learning. We believe that Brunswik's (1955) criticism about the probabilistic representativeness of such experiments is especially pertinent. We destroy a meaningful part of research when we remove variables from their natural or "whole" environment to study them in the laboratory. Second, and

probably the most serious threat to experimental research of this type, has been advanced by Farr, Vance and McIntyre (1977). In an attempt to replicate the Deci effect, they performed an experiment similar to the one he reported. Their analysis of data included an F-test for normality. Based on the information of the F-test (non-normality of the data) the experimenters were forced to select nonparametric statistical analyses for their results. They also re-examined Deci's data for appropriateness of statistical analyses. It turns out that their results were non-significant. That is, Deci's results when properly examined and analysed revealed that there were no significant differences in the effects of extrinsic rewards on intrinsic motivations. Deci(1971) reports "significance" at the $p < .10$ level. This is not an acceptable level of significance. Psychological research requires a minimum of 95% of certainty not 90%.

The third criticism questions the validity of experimental results that are based upon different variables,different subjects and different motives. Breen (1970) has provided some evidence in accordance with our preferences for the value of extrinsic rewards to enhance intrinsic motivation.

She used a Discussion Group designed to be intrinsically motivating for changing study habits and a Task Group which simply added extrinsic rewards to a group of students already intrinsically motivated to change their study habits. Five to fifteen weeks after the five week training session, the control group showed little change. The intrinsically motivated Discussion Group reported that 50% were still using the new study habits. The intrinsically motivated and extrinsically rewarded Task Group reported that 68% were still making use of the new study habits. Adding reinforcements does not appear to jeopardize academic achievement motivation, but may rather enhance it.

There are some researchers who have hypothesized and verified that extrinsic rewards may operate through cognitive attribution (Higgins,1977) or satisfaction (Romanuk,1976) to attain intrinsic motivation. That is, the student's cognitive structure operates on the perceived reward or extrinsic reinforcement to create a value or intrinsic motive. It appears then that intrinsic motives are a function of one's perceptual expectations and value attributions. The fourth and final difficulty is, as Calder and Staw (1975) report, in the methodological problem of the operational definition of "intrinsic motivation." The general body of research relevant to extrinsic-intrinsic motivation fails to distinguish between the attributed and the objective causes of intrinsic motivation. Calder and Staw (1975) suggest "...to relate the self-perception of intrinsic motivation to task performance without making any premature assumptions about the actual existence or nature of intrinsic motivation (page 79)."

As we can understand,it is preferable to define intrinsic motivation as the relation of the student's self-report on performance and attitudes to his actual performance. We have developed the point that learning experiences lead the student to expect goals and to perceive the motivational processes to attain these goals. Expectancy and attribution theories are thus two central constructs in explaining the relationship between reinforcement and academic achievement.

Academic Achievement: Reinforcement History, Attributions and Expectations for Success or Failure:

Could students be reinforced for failing? Could students be reinforced to fail because they fear success? Are there classes of reinforcements better

suited for students who expect success rather than failure? What is the relationship of reinforcement to intrinsic motivation? Finally, are there students more able or less able to perceive reinforcement availability?

First,we must recognize that expectations are intrinsic motives (Wernimount,1966) derived from the student's social reinforcement history. Baron (1966) has shown that the rate of reinforcement the student is likely to accept is based on such a reinforcement history. It appears then that students are not necessarily reinforced for failing as much as they will not allow reinforcements to affect them.

Phenomenological and Behavioristic Psychology appear to be the single best unifying concepts for studying this problem. Epstein (1973) argues rather convincingly that it is possible to arrive at a broad definition of "self-concept" to accommodate both the sujective-phenomenological and objective-behavioristic points of view.

> ...(T)he self-concept is a self-theory. It is a theory that the individual has unwittingly constructed about himself as an experiencing, functioning individual, and it is part of a broader theory which he holds with respect to his entire range of significant experience. Accordingly, there are major postulate systems for the nature of the world, for the nature of the self,and for their interaction.
>
> .....
>
> The most fundamental purpose of the self-theory is to optimize the pleasure/pain balance of the individual over the course of a lifetime. Two other basic functions, not unrelated to the first, are to facilitate the maintenance of self-esteem, and to organize the data of experience in a manner that can be coped with effectively.
>
> (1973; page 407)

Of particular concern to us are several attributes which he proposes are common to all theories —— including the self-theory of self-concept for students failing or abandoning courses. The student who abandons courses

holds more illusions about his self-theory under stress and thus avoids subjecting his self-concept to reality-testing. That is, the abandon type student holds untestable self-concepts. The student who fails, however, holds an inadequate Ego Defense system under stress with an all-or-none quality that either leads him to give up efforts to understand himself, or to see the usefulness of a concept of the self, or to be overwhelmed by the data input such as to become temporarily disorganized. All of us avoid subjecting our most cherished self-concepts to reality testing in order to avoid the stark naked truth, which is anxiety producing. We like to think that when we re all dressed-up that we "look good". When we ask someone what they think of our appearance, we don't really want to hear anything except that we "look good." The problem with the failure and abandon type of students then is that the former are too defensive --- they don't want to hear <u>any</u> of the truth. The abandon student is even worse off because he won't even formulate any self-concept that could possibly be tested.

The explanation of the relationship between the rate of reinforcement that a student accepts and his fear of success or failure is well summarized by Epstein (1973):

> One tendency is for the individual to wish to raise his self-esteem, as high self-esteem feels good. The other is for the individual to wish to avoid a drop in self-esteem, as a drop in self-esteem feels particularly bad. Accordingly, the individual avoids evaluating himself unrealistically highly, as this would expose him to decreases in self-esteem. As a result, it can be expected that even under the most favorable circumstances self-esteem will tend to increase only gradually.
>
> (1973; page 415)

Phares (1971) reports that external locus of control persons devalue tasks after failing when they initially had valued them most. That is, it appears that students who may be typed as "externals" and who attend Cegep with high hopes for personal and professional development and subsequently fail, devalue the Cegep more than any other group. Their values for an education are seriously attacked. Festinger's (1957) cognitive dissonance theory adequately explains that a "trade-off" must occur within the individual to restore balance or "consonance." The student values an education and expects the Cegep to afford him the opportunity to gain one. His academic behavior does not produce the desired or "valued" results. He must then admit to himself that he is incompentent, a high anxiety producing decision, or admit that he over-valued the initial Cegep education, a low anxiety producing decision. He consequently devalues the worth of a Cegep education.

It seems appropriate at this point to explain the difference between self-concept and self-esteem. The mental images that one creates about one's physical, mental, social and emotional characteristics result in the self-concept. The values one attaches to such evaluation procedures is the self-esteem. In the light of the current discussion, we may conclude that students who fail or abandon do so because their self-concept cannot handle any dissonant feedback. If this does occur, they "devalue" their perception of the situation with an almost automatic behavior that reduces their self-esteem.

Phares (1976) has devoted much time and effort to research the relationship between personality and responsibility (locus of control). He concludes that failures in learning "...are due to strong needs with low expectancy of reinforcement (page 18)" There is no doubt that the development of one's self-concept is a strong need. If the student attends Cegep with a strong conscious

or unconscious need to develop his identity and he fails to discover appropriate sources of reinforcement, then he may abandon or fail because it is the "easier" or less anxiety-producing decision.

Fromm (1955) has clearly argued that if persons cannot be an educational success then they can be an educational failure. Students are willing to sacrifice their own self in order to develop even an illusory sense of identity based upon group conformity. The classic example of this is the pride with which students admit to failing or abandoning. They belong to the group of individuals within the Cegep that are "failures," or "abandons." If we notice, these students rarely leave the campus when it is evident that they are failing, or that they have abandoned their courses. They lounge around and flaunt their "status" based on this new found identity.

If the student does not perceive the Cegep as an educational experience capable of helping him to change, *without threatening his self-concept*, from what he is to what he would like to be, then he will likely respond with low rates of behaviors to reinforcements. Reinforcements will be viewed as sources of dissonance.

Goldstein (1940) was one of the early personality theorist's to notice this:

> Ultimately all failures in social organization are caused by an underestimation of the significance of the abstract attitude and by a misjudgment of the detrimental influence which can emanate from human traits if one changes them through artificial isolation**.
>
> (1940;page 318)

> The experiences a person has, or is able to assimilate or acquire, hinge upon his capacities and these we can infer from his preferred ways of behavior. Only if given the opportunity to realize himself in these ways will he be in an ordered state, which is the basis of good performance; in other words, the more the demands made upon him correspond to his preferred ways of behaving, the more nearly perfect will his achievements be.
>
> (1940;page 314)

** Such as in the classroom.

In conclusion, we are suggesting that the student's expectations for success or failure are related to the perceptual source of attribution. Whether he attributes success to himself or to others makes a significant difference in the effects that reinforcements,and responsibility for self-involvement have on performance.

Academic Achievement: Self-concept and Self-Esteem:

Marecek and Mettee (1972) experimentally assessed the effects of announced skill or chance directions on the development of self-esteem. Seventy-two females were solicited to participate in an experiment on the supposed side-effects of psychiatrist prescribed medication. The real independent variables were self self-esteem, certainty of the validity of these self-esteem estimates, and perceived responsibility for success. The dependent variable was change in self-esteem and attribution for such change. The girls were then assigned according to questionnaire results, to one of eight groups (High vs Low self-esteem; Certainty vs Uncertainty; and Skill vs Luck directions). The results are very encouraging. Students with low self-esteem (failures) who are convinced of this low esteem state and who feel that their personal effort (skill) led to success, tend to avoid further success. That is, the high and low self-esteem subjects improve if they are not told that their skills lead to success or failure.

> These findings demonstrate that self-determined success has a relatively counterproductive effect on the person with chronic stabilized low self-esteem.
>
> (Marecek & Mettee,1972; page 104)

This suggests that the performance of low self-esteem/certain/skill (responsible for their success) group "... did not actually deteriorate following success , but they did fail to improve, and in so doing, avoided further success(page 104)."

Marecek & Mettee conclude that "...though a successful outcome is completely due to luck in an objective sense, a person may take partial credit for the success and thereby gently raise his self-esteem. ... ...This partial credit for success notion provides a basis for drawing the low self-esteem person subtly toward a positive self-evaluation (page 105)." "In this manner it may be possible to change negative self-appraisals into positive ones (page 106)."

Fitch (1970) reports an experiment in which 135 business students were assigned, on the basis of test scores, to one of eight groups (High vs Low Self-Esteem; High vs Low Choice to participate, and Success vs Failure for Perceived Performance).

> The purpose of the present experiment was to resolve a discrepancy in the literature with respect to whether people interpret event outcomes in a way consistent with chronic self-esteem or in a way which enhances chronic self-esteem. A secondary purpose was to determine whether a person's degree of choice in participating in the experiment influenced his interpretations of event outcomes.
>
> (1970;page 312)

> A somewhat speculative conclusion is that while high self-esteem subjects tend to "internalize" success but not failure outcomes, low self-esteem subjects tend to internalize both success and failure.
>
> (1970;page 315)

An interesting artifact of Fitch's design was that "...low self-esteem subjects tended to score toward the external end of the Internal-External control scale (page 315)." Aggarwal and Singh (1974) have confirmed in a correlational study that Internal Locus of Control and External Locus of Control are significantly and positively related to a high or low self-concept, respectively. Gergen (1965,1972) reports that one's self-esteem is

actually derived from what we think others think of us. The implication we may draw from these studies is clear. It is important for student's self-esteem and self-concept that teachers be perceived by their students as holding a positive view of them.

In conclusion, we have argued that self reinforcement is the ultimate goal for the development of one's identity. Fish and Karabenick (1971) have shown that the higher the self-esteem, the higher the potential for self-reinforcement. The work of Schwarz (1966) supports our suggestion that when such expectancies of reinforcements develop, they tend to reappear in similar circumstances. So the generalization,and hence applicability,of these procedures could help students who fail or abandon to develop more adequate expectancies for success based on re-evaluated self-appraisal attributions.

Kellogg (1973) has shown that teacher attitudes towards student individualization interact with student locus of control to affect learning attitudes. Alschuler in Developing Achievement Motivation in Adolescents (1973) concludes that this is probably the most efficient, viable motive for academic achievement.

Allport (1961) proposed a molar personality concept "perceptual set" which is based upon one's attitudes, meanings, motives, and values. Accordingly, healthy perceptual sets produce realistic perceptions as an element of maturity. A further element of maturity in Allport's multidimensional theory is the attainment of "skills and assignments" or personal,vocational, and social competencies. Our attempts, as teachers, to have students develop academic competency or realistic perceptions in perfecting their skills,are conducive to the development of maturity. We would like to stress, based on the literature of the Psychology of Adjustment, that it is not the attainment of matu-

rity but rather the process of working towards this end which organizes broadens and contributes to the positive development of identity.

What types of reinforcements would likely be of value to help motivate students? Since self-esteem is the central construct and values are related to behaviors, we would do well to use the student's meanings and values of work.

We can expect that where needs and values are met that the student will achieve motivation to study (Berger,1964). Packwood (1973) derived a Motivation Check-Sheet that appears to be "...a step toward helping junior colleges to more accurately predict the academic achievement of their students (page 301)." Upon analysis of this questionnaire we note several similarities with the Meaning and Value of Work Scale(MVWS) developed by Kazanas (1975). We prefer the MVWS because it provides two separate scales for the measurement of extrinsic and intrinsic motivation within the value of work scale. ALso, the reliability, validity, and sampling considerations make it highly appropriate fro use in Cegeps.

The final consideration for its use is that it is fairly easy to work from the subscales to design an operant technology program to shape the student's self-esteem and responsibility for success, as Fitch (1970) and Marecek & Mettee(1972)have shown.

Academic Achievement & Locus of Control:

Katkovsky,Crandall & Good (1967) have discovered that parents characterized as providing social reinforcers (approval, attention, acceptance etc.) as well as emotional warmth and social support are likely to produce children who develop a greater sense of internal control. Crandall, Katkovsky and Crandall (1965) had further reported that internal locus of control, or

responsibility,is present by 3rd grade. As we have shown from the work of Newman & Newman (1975) this corresponds to the ages for the development of academic achievement.

Rotter's (1955,1966,1967) Locus of Control is a sufficiently powerful unifying concept to relate several variables to academic achievement. Students who believe that they are the ones to primarily give direction and meaning to their lives have an internal locus of control (ILC). Students who believe that the social and physical environment give direction and meaning to their lives have an external locus of control (ELC).

Bar-Tal and Bar-Zohar (1977) have confirmed in an extensive review of the literature that locus of control is significantly related to academic achievement. Our particular interest is with increasing locus of control in students who apparently have insufficient levels of it. If we could increase the ILC of students who have low self-esteem, then we may expect to have better academic achievement. There have been a sufficient number of independent studies to accept the conclusion that self-concept is related to academic achievement (Fink,1962; Fekrat,1969; Bauer,1970;Bauer & Snyder,1972;Cross & Allen,1970; and Render, 1973).

Of particular concern to us is Trainotti's (1978) finding that the better or more organized the self-concept, the higher is the ILC. There are a host of studies that have shown that an ILC is related somehow to academic achievement. Simmons (1960) revealed that ILC and discovering alternative solutions to problems is related. ILC students appear to be more psychologically integrated (Duncan,1966), more achieving, independent, and effective (Hersch & Scheibe,1967), to make fuller and better use of time (Platt & Eisenmann, 1968), to be more discriminative of sources of reinforcement (Schwarz, 1969), more approach oriented (Saleh & Grygier,1969), and more self reinforcing (Fish & Karabenick,1971). Internals also blame themselves more for

failures (Davis & Davis,1972) and are more likely to use feedback to alter their academic performance (Prociuk & Breen,1977).

If things were as simple as they seem we would measure Locus of Control and then work with those students not sufficiently high in ILC. Things are not this simple because it appears that external and internals are not motivated by the same set of variables (Wolk & DuCette,1971). ELC students apparently fail to adequately discriminate situations for possible sources of reinforcements (Lefcourt,1967). Biondo & Macdonald (1971) reported that ELCs' respond to both high and low levels of influence. Ritchie & Phares (1969) have shown that ELC's are more susceptible to change attitudes in the direction of agreement with a high status communicator, *such as a teacher*, then are ILC's.

We can safely conclude that ILC students are not likely to be the ones significantly contributing to failure and abandon rates.

There appears to be what Adams (1977) has called defensive versus congruent externals. The characteristics of the defensive external are those of a student low in self-esteem and uncertain about his judgment. The congruent externals are low in self-esteem and convinced of their low self-esteem.

So, the externals are likely to increase their avoidance behaviors if we reinforce them through opportunities to express their skills. As we have seen in the Marecek & Mettee (1972) and Fitch (1970) studies on self-esteem, and the Ritchie & Phares (1969) study above the ELC students are most likely to benefit from teacher attempts to *gradually* change their self-esteem, evaluation of self-esteem, and responsibility for change. That is, self-esteem and success when based on either skill or chance but unannounced conditions contribute to the development of responsibility and identity.

In closing, Fekrat (1969) has shown the self-concept to have a "shortrange predictive power" on grades. We conclude that the Locus of Control and the Meaning and Value of Work Scales are sufficiently valid, reliable, and powerful instruments, which may be quickly administered, scored, and interpreted, to help students develop responsibility and self-esteem.

The most appropriate time for such efforts is during the late adolescence stage. At this time the self-concept crytalizes (Stark & Traxler,1974). Wiggins et al. (1971) in a chapter on the relationship of competency to personality quote the work of Diggory (1966) on the concepts of instrumentality, probability of success, self-evaluation and performance. Their remarks are most pertinent:

> The conclusion is clear: under conditions of success a person will work harder and remain involved, but under conditions suggesting imminent failure his self-evaluation is low, he tends to give up, and his performance is poor.
>
> Self-evaluations based on estimating the probability of success are high when a deadline is distant or vaguely located, when rates of improvement are large, and when the difference between performance and goal is small. Conversely, self-evaluations are low when these conditions are reversed.
>
> (1971;page 417)

This is in perfect harmony with Epstein's Self-Concept as a Self Theory. Student's who typically fail or abandon are unable to make an efficient use of time, work schedules and planning. Students of this type usually identify work as "simple" or "too difficult". In the first case they postpone comleting the assignment until it is too late, or they rush through it "to get it out of the way," in the second case. The review of

of the literature has borne this out.

We conclude with this thought:

> When capacities are inadequate or no goals exist, the concept of achievement is no longer meaningful.
>
> (Wiggins et al.,1971;page 419)

HYPOTHESES:

Intrinsic Motivation:

H_1: There exists a significant difference in intrinsic motivation between ILC and ELC students.

H_2: There exists a significant difference in intrinsic motivation between students in the Announced and Unannounced conditions.

H_3: There exists a significant difference in intrinsic motivation between students in the contingent (skill) and non-contingent (chance) conditions.

Locus of Control:

H_4: There exists a significant difference in the Meaning of Work between the ILC and ELC students.

H_5: There exists a significant difference in the Value of Work between the ILC and ELC students.

H_6: There exists a significant difference in the Locus of Control scores between students passing versus failing.

Meaning and Value of Work:

H_7: There exists a significant difference between the Meaning of Work for students passing versus failing.

H_8: There exists a significant difference between the Value of Work for students passing versus failing.

Academic Achievement:

H_9: There exists a significant difference in academic achievement between ILC and ELC students.

H_{10}: There exists a significant difference in academic achievement of the first versus second half of the semester for students failing (F) in the Control Group(00). We expect them to get worse.

H_{11}: There exists a significant difference in academic achievement of the first versus second half of the semester for students failing (F) in the Skill-Announced Group (11).If there is a change it will be for the better.

H_{12}: There exists a significant difference in academic achievement of the first versus second half of the semester for students failing (F) in the Chance-Announced Group (22). If there is a change it will be for the better.

H_{13}: There exists a significant difference in academic achievement of the first versus second half of the semester for students failing (F) in the Chance-Unannounced Group (33). If there is a change it will be for the better.

H_{14}: There exists a significant difference in academic achievement of the first versus second half of the semester for students failing (F) in the Skill-Unannounced Group (44). If there is a change it will be for the better.

H_{15}: There exists a significant difference in academic achievement of the first versus second half of the semester for students failing (F) in the Announced Groups (11 & 22). We expect them to get better.

H_{16}: There exists a significant difference in academic achievement of the first versus second half of the semester for students failing (F) in the Unannounced Groups (33 & 44). If there is a change it will be for the better.

H_{17}: There exists a significant difference in academic achievement of the first versus second half of the semester for students failing (F) in the Skill.Groups (11 & 44).

H_{18}: There exists a significant difference in academic achievement of the first versus second half of the semester for students failing (F) in the Chance Groups (22 & 33). If there is a change it will be for the better. We expect them to get better.

METHODOLOGY:

The Evaluation Instruments:

Measuring the internal locus of control versus the external locus of control necessitated using the scale developed by Rotter (1966).We followed the suggestion of Wuensch and Lao (1975) and designated ELC or ILC students as those who scored in the top or bottom third, respectively. This procedure allowed us to be relatively sure that we had neither rejected potential ELCs or ILCs nor erroneously accepted them.

The student's perception of rewards and reinforcements was assessed with the instrument: "Meaning and Value of Work Scale," developed by Kazanas and associates (1975). The population, sample, and statistical considerations were very well suited for our needs. More importantly, the MVWS provided seven subscales for each of the Meaning of Work (MW) and Value of Work (VW) Scales, as well as giving direction (intrinsic versus extrinsic) on the VW Scale.

The teacher and course evaluation questionnaires were those developed by Hoshaw (1936)*and Hand (1953)* respectively. The statistical considerations and samples of these questionnaires was appropriate for our needs and their choice of questions was most pertinent.

The dependent variable, intrinsic-extrinsic learning motivation (academic achievement), may have been particularly difficult to measure. Dividing motivation into an intrinsic-extrinsic dichotomy is contested because it eludes rigid operational definition. Validity and reliability, when reported, may not be appropriate to other than the population tested. Mayo (1976) has developed, and validated on a sample relevant for our study, a paper and pencil test of motivation that allowed us to assess changes in student intrinsic-extrinsic motivation.

* cited in Shaw & Wright,1967.

Definitions:

Motivation: The drive state which reflects the student's wants and the incentive state which reflects the student's expectations and aspirations of satisfying them.

Intrinsic Motivation: Reinforcement is internal to or mediated by the student and there is no external influence from rewards, payoffs, or other inducements for his performance. Such factors as success, satisfaction, and pride are forms of intrinsic motivation.

We agree with Calder & Staw's (1975) suggestion to operationally define "intrinsic motivation" as the relation of the student's perception of his performance to learn with his attitudes in that learning situation.

Extrinsic Motivation: Reinforcement is external to the student and is related to rewards, inducements, or payoffs for his performances. Grades, social and physical stimuli in the environment, and feedback are examples of extrinsic motivation.

Contingency: Contingent performances are determined by the degree of effort or skill between a behavior and the consequences of such behaviors. For example, working or studying to earn a grade in which the quality of the grade is proportional to the effort expended is a contingent situation.

Noncontingency: Noncontingent performances are determined by chance factors which do not relate behavior to consequence. For example, attending class is a chance factor between the time passed in class and learning. Being present does not cause learning to occur.

Locus of Control: Students who believe that they are the ones to primarily give direction and meaning to their lives have internal locus of control. Students who believe that the social and physical environment give direction and meaning to their lives have external locus of control.

Announced / Unannounced Rewards: The specific motivational variables that the student had identified for us on the MVWS were used to specify the nature of rewards and reinforcements. In the Announced Reward Condition (ARC) students were told that desired academic behaviors would be reinforced according to their declared MVWS preferences. Students who were not told that desired academic behaviors would be reinforced with the declared MVWS preferences were in the Unannounced Reward Condition (URC).

Basic Assumptions:

The initial premise of this project is that students are able and willing to study —— in various degrees. This project proposes that in some cases students receive abandon (ABD) or failure (F) grades not because of a lack of ability but rather because they have failed to form a "psychological contract". This is an unwritten agreement that binds teachers and students to put effort into their work, and to assume the responsibilities necessary to bring about the desired effect, which in this case is academic achievement or learning.

Of the total number of students in the Cegep system there are several thousand who abandon or fail because of a faulty psychological contract.

The variety of reasons and excuses to motivate these abandons and failures are oftentimes based upon personal and/or social inadequacies. Naiveté, inappropriate level of aspiration, misperceived level of ability, unfulfilled expectations, inadequate personal preparation, and vague career and personal goals are the major types of motives that contribute to forming an inappropriate psychological contract. It is a fair assumption that the many students who fail or abandon,because of this faulty psychological contract have problems assuming the responsibilities related to getting an education.

We assume that personal learning motivation is related to motivational, personality, and perceptual states that interact to produce a personal theory about one's "self." Once the student's identity is more clearly delimited from others and the environment, he is able to take on the challenge or responsibility of living. A significant part of this living, within collegiate education, is academic achievement.

Peck (1971) has clearly suggested the importance of relating learning motivation to self-determined rewards, postulate 3, to an internal locus of control , postulate 4, and to identity,postulate 5.

> Man naturally and continually classifies and organizes his impressions into conceptual patterns on both an unconscious and conscious level. He draws connections and establishes relationships between his experiences and observations and categorizes them for future retrieval as guides to action. Furthermore, experience and environment are perceived differently by each person according to his interests of the moment, past history, or preconceptions. No two people will construct precisely the same image of an experience or of any given object or surroundings.

> Man is motivated to move in directions of thinking and behaving that grant him a sense of understanding or mastery of those aspects of the environment that affect him. He avoids situations in which he feels helpless or not in control of the factors that influence him.
>
> Man desires status as a unique and independent individual. He seeks an "identity" for himself as a person and eschews being manipulated or treated as an object or thing. He desires to think of himself as worthwhile and of value both to himself and others.
>
> (Peck,1971; page 8)

The professor is assumed to be intrinsically motivated to act as a model for the distribution of student-determined rewards and reinforcements, as well as a guide to help students discover truths and facts about themselves. This means that the professor is willing to enter into a psychological contract with the student.

It may be that personality characteristics, philosophical orientation, and educational background of the professor interact to produce this assumption. This possibility will be examined in a second project which takes account of teacher characteristics. For our current needs, a matrix based on the significance of correlations of learning motivation variables, including teacher and course, seemed sufficient.

Design:

ILC and ELC, contingent (skill) and noncontingent (chance) directions, as well as ARC and URC were the independent variables. Locus of control, type

of reward and intrinsic motivation were determined by the scales described at the beginning of this chapter.

Subjects in one of the four conditions (Announced-Skill; Announced-Chance; Unannounced-Skill; and Unannounced-Chance) received directions and reinforcements appropriate to their condition (see Design:Stimuli). The fifth group received no reinforcements and thus was the control group.

Control procedures were included to guard against teacher and course effects, as well as systematic or random errors.

Design: Subjects

Students matriculating for the Fall,1979 semester at Champlain Regional College, St-Lawrence Campus served as the population of subjects for the experiment. Of the several hundred students in Social Sciences, 170 signed up for Psychology courses. They formed the samples assigned to the experimental groups.

Subjects were their own controls because of the inherent difficulty in matching several objective and subjective characteristics.

Design: Stimuli

All students were asked at mid-semester to complete a set of questionnaires designed to assess their attitudes and perceptions towards studying. The instructions were:

> We need information about adolescent and young adult attitudes and perceptions towards studying. The results will be presented to you when we are finished analysing them. Be certain to complete all items. Follow the directions on each questionnaire. Thank you.

In addition, students in the Announced condition were told:

> We have the results for the Meaning and Value of Work Scale you completed. We will make every effort to give you feedback about yourself in relation to this course, by using reinforcements based upon these results.

Students in the Unannounced condition did not receive these directions.

Skill direction were presented as follows:

> Your success in the course is directly determined by the skills you possess or that you learn to develop..

Finally, Chance direction were read as follows:

> Your success in the course is directly determined by chance. The chance that examinations cover what you studied. The chance that the lectures and other activities will be spaced to coincide with your abilities.

Design: Procedure

The first half of the semester served as a baseline period. This yielded control data to be compared with treatment data from the second half of the semester.

Information from the MVWS was used by the professor to reinforce students in the second half of the semester. Lectures were directed at relating the importance of the topic under discussion to the students' identity. The reinforcement offerred was the application of the students' expressed Meanings and Values to the course materials, so as to make the latter relevant to their self-concept. The MVWS is sufficiently detailed to allow professors,in most subjects, to develop adequate reinforcers from its subscales.The professor examines the students' meanings and values and makes two decisions: Are these Meanings and Values related to the course? If so, he must develop frequent applications for course material. The name and order of each subscale will guide him to select appropriate reinforcers.

Table 1 is an example of this procedure.

If the professor decides that the meanings and values are not suitable for his course, he then selects the next most appropriate scale and so on. Obviously, the magnitude of the expressed meanings and values is important. Each subscale expresses, as a percentage, the number of students who chose it as their first or second choice (see Table 1, Total(%)*).

Our reinforcements were related to the self-concept through the inspirations of Calhoun and Acocella (1978), Lindgren & Fisk (1976), and Newman and Newman (1975).

TABLE 1

First and Second Choices of Meaning and Value of Work for Control and Experimental Groups.

GROUP:	MEANINGS			VALUES		
	First Choice (%)	Second Choice (%)	Total (%)*	First Choice (%)	Second Choice (%)	Total (%)*
			Control Group			
Scientific Foundations of Psychology I	Pro (68%)	SoO (24%)	(92%)	StaEco (80%)	SelPre (8%)	(88%)
			Announced-Skill Condition			
General Psychology A	SoO (78%)	Exp (19%)	(97%)	StaEco (84%)	IntRec (16%)	(100%)
			Announced-Chance Condition			
General Psychology B	SoO (71%)	Exp (29%)	(100%)	StaEco (59%)	SelSec (18%)	(77%)
			Unannounced-Chance Condition			
Industrial Psychology A	SoO (71%)	Pro (16%)	(87%)	SelSec (64%)	StaEco (22%)	(86%)
			Unannounced-Skill Condition			
Industrial Psychology B	Pro (63%)	SoO (27%)	(90%)	StaEco (83%)	SelPre (14%)	(97%)

* Percentage of students in this class/group.

Pro (Productivity);SoO (Societal Orientation);Exp (Experience)
StaEco (Satisfaction vs Economic);SelPre (Self Discipline vs Prestige);
IntRec (Interesting Work vs Recognition);SelSec (Self Actualization vs Security).

RESULTS:

TABLE 2

Correlation Matrix of Meaning, Value of Work and Locus of Control.

VARIABLE:	Meaning of Work	Value of Work	Locus of Control
Meaning of Work	1.0000 (162) p=*****	0.1689 (162) p=0.016	0.1970 (162) p=0.006
Value of Work	0.1689 (162) p=0.016	1.0000 (162) p=*****	0.2108 (162) p=0.004
Locus of Control	0.1970 (162) p=0.006	0.2108 (162) p=0.004	1.0000 (162) p=*****

(Coefficient/(Cases)/Significance)

TABLE 3

Meaning and Value of Work for Internal versus External Locus of Control: t-test statistics and data.

VARIABLE:	Number of Cases:	Mean:	Standard Deviation:	t-value:	Degrees of Freedom:	2-tail Probability:
MEANING:	30 14	159.3000 150.1429	11.366 13.620	2.34	42	0.024*
VALUE:	30 14	29.8333 26.2143	5.784 3.806	2.31	42	0.039*

* Significant at p >05

TABLE 4

Pearson Correlation Coefficients and levels of significance for learning motivation matrix.

	Intrinsic Motivation	Extrinsic Motivation	Teacher Evaluation	Course Evaluation	Question #59 + 62	Question # 63	Question # 64	Mid-Term Grade	Meaning of Work Score	Value of Work Score	Locus o Control
Intrinsic Motivation:	*****										
Extrinsic Motivation:	0.5095 (0.000)	*****									
Teacher Evaluation:	0.2096 (0.004)†	0.1402 (0.038)Ψ	*****								
Course Evaluation:	0.1661 (0.018)†	0.0475 (0.275)	0.0026 (0.487)	*****							
Question #59 + 62: *	0.5260 (0.000)	0.2434 (0.001)†	0.2320 (0.002)†	0.1569 (0.023)Ψ	*****						
Question #63: *	0.4516 (0.000)	0.2285 (0.002)†	0.2880 (0.000)	0.2418 (0.001)†	0.4604 (0.000)	*****					
Question #64: *	0.4240 (0.000)	0.2611 (0.000)	0.2374 (0.001)†	0.2142 (0.003)†	0.3691 (0.000)	0.8411 (0.000)	*****				
Mid-Term Grade:	0.3263 (0.000)	0.0818 (0.151)	0.5673 (0.000)	0.1327 (0.047)Ψ	0.3622 (0.000)	0.3505 (0.000)	0.3314 (0.000)	*****			
Meaning of Work Score:	0.2551 (0.001)†	0.2220 (0.002)†	0.1532 (0.026)Ψ	0.0133 (0.433)	0.1025 (0.098)	0.0263 (0.370)	0.0571 (0.236)	0.1101 (0.082)	*****		
Value of Work Score:	0.1610 (0.021)Ψ	0.1016 (0.100)	0.1973 (0.006)†	0.0025 (0.488)	0.1181 (0.068)	0.0492 (0.268)	0.0370 (0.321)	0.0330 (0.339)	0.1743 (0.013)Ψ	*****	
Locus of Control:	0.1825 (0.010)†	0.0108 (0.446)	0.0609 (0.221)	0.0835 (0.146)	0.1120 (0.079)	0.1059 (0.091)	0.1120 (0.079)	0.0773 (0.165)	0.2101 (0.004)†	0.2106 (0.004)†	*****

Correlation/(Significance)ψ,†

* See "Learning Reaction Questionnaire" questions numbered 36 and 39, 40, and 41 respectively.

TABLE 5

Linear Regression of Mid Term Grades (X) on Intrinsic Motivation Scores (Y) of all students *passing* (Grade $\geq$ 60) at Mid Term.

	GROUPS			
	11	22	33	44
β =	0.449	-0.069	-0.103	0.007
α =	0.012	27.722	44.021	39.43
RSS =	9277.983	4726.178	4081.879	4683.933
r =	0.201	0.038	0.071	0.004
$\overline{X}$ =	71.73	72.23	72.54	76.52
$\overline{Y}$ =	32.23	22.73	36.54	40.00
S_x =	8.158	7.623	8.797	7.089
S_y =	18.26	13.760	12.810	13.970
t =	1.084	0.019	0.035	0.018
p =	0.29	0.000	0.000	0.000
N =	30.	26.	26.	25.

TABLE 6

Linear Regression of Mid Term Grades (X) on Intrinsic Motivation Scores (Y) of all students *failing* (Grade $\leq$ 59) at Mid Term.

	GROUPS			
	11	22	33	44
β =	9.037	-15.429	0.298	-0.279
α =	-480.593	927.143	17.962	46.987
RSS =	2081.482	926.286	235.512	1057.017
r =	0.588	0.647	0.195	0.079
$\overline{X}$ =	56.500	58.200	53.200	45.000
$\overline{Y}$ =	30.000	29.200	33.800	34.429
S_x =	1.643	0.837	5.119	3.786
S_y =	25.235	19.958	7.823	13.315
t =	1.455	1.470	0.344	0.178
p =	0.23	0.26	0.75	0.87
N =	6.	5.	5.	7.

TABLE 7

Linear Regression of Mid Term Grades (X) on Value of Work Scores (Y) for all students *failing* (Grade $\leq$ 59) at Mid Term.

	GROUPS			
	11	22	33	44
β =	-0.667	-5.714	0.487	0.395
α =	62.667	360.571	-0.889	12.638
RSS =	8.000	56.571	3.181	228.272
r =	0.655	0.786	0.941	0.236
$\overline{X}$ =	56.5	58.2	53.2	45.
$\overline{Y}$ =	25.	28.	25.	34.429
S_x =	1.643	8.367	5.119	3.786
S_y =	1.673	6.083	2.646	6.347
t =	1.732	2.202	4.816†	0.543
P =	0.17	0.13	0.02	0.61
N =	6.	5.	5.	7.

†Significant at p 02 level

TABLE 8

Linear Regression of Mid Term Grades (X) on Meaning of Work Scores (Y) for all students *failing* (Grade $\leq$ 59) at Mid Term.

	GROUPS			
	11	22	33	44
β =	5.259	19.000	1.082	-1.861
α =	-147.482	12.60	103.034	239.435
RSS =	405.926	690.	242.494	163.754
r =	0.692	0.771	0.580	0.803
$\bar{X}$ =	56.5	58.2	53.2	45.
$\bar{Y}$ =	149.667	154.2	160.6	155.714
S_x =	1.643	0.837	5.119	3.786
S_y =	12.485	20.62	9.555	8.770
t =	1.918	2.097	1.233	3.013†
P =	0.14	0.14	0.31	0.04
N =	6.	5.	5.	7.

† Significant at p 04 level

TABLE 9

Linear Regression of Mid Term Grades (X) on Intrinsic Motivation Scores (Y) of all students by groups *failing* (Grade $\leq$ 59) at Mid Term.

	GROUPS				
	11+22	33+44	11+44	22+33	11+22+33+44
β =	3.105	-0.020	-0.063	-0.41	-1.893
α =	-148.211	35.15	35.93	54.26	41.965
RSS =	4545.368	1309.51	4228.23	1862.10	6175.150
r =	0.221	0.011	0.022	0.123	0.071
$\overline{X}$ =	57.273	48.42	50.31	55.7	52.65
$\overline{Y}$ =	29.636	34.17	32.77	31.5	32.
S_x =	1.556	5.93	6.63	4.35	6.26
S_y =	21.860	10.91	18.78	14.49	16.80
t =	0.680	0.035	0.073	0.351	0.326
P =	0.53	0.000	0.000	0.74	0.75
N =	11.	12.	13	10	23.

TABLE 10

Linear Regression of Mid Term Grades (X) on Value of Work Scores (Y) of all students by groups *failing* (Grade $\leq$ 59) at Mid Term.

	GROUPS				
	11+22	33+44	11+44	22+33	11+22+33+44
β =	-0.459	-0.116	-0.34	0.426	-0.171
α =	52.63	33.78	44.80	2.76	36.33
RSS =	181.46	350.47	291.66	167.60	535.65
r =	0.165	0.121	0.411	0.395	0.212
$\overline{X}$ =	57.27	48.42	50.31	55.7	52.65
$\overline{Y}$ =	26.36	28.17	27.92	26.5	27.30
S_x =	1.56	5.93	6.63	4.35	6.26
S_y =	4.32	5.69	5.41	4.70	5.05
t =	0.502	0.386	1.495	1.216	0.994
P =	0.64	0.71	0.17	0.26	0.34
N =	11.	12.	13.	10.	23.

TABLE 11

Linear Regression of Mid Term Grades (X) on Meaning of Work Scores (Y) of all students by groups *failing* (Grade $\leq$ 59) at Mid Term.

	GROUPS				
	11+22	33+44	11+44	22+33	11+22+33+44
β =	1.534	1.816	-0.60	-0.136	-0.236
α =	63.789	148.959	182.88	164.86	167.26
RSS =	2517.65	883.495	1172.19	2214.96	3637.27
r =	0.149	0.119	0.371	0.038	0.114
$\bar{X}$ =	57.27	48.42	50.31	55.7	52.65
$\bar{Y}$ =	151.64	157.75	152.92	157.3	154.83
S_x =	1.555	5.931	6.63	4.35	6.26
S_y =	16.045	9.026	10.64	15.70	12.94
t =	0.452	0.377	1.325	0.108	0.526
P =	0.66	0.72	0.22	0.000	0.61
N =	11.	12.	13.	10.	23.

Statistical formulae used in the calculation of Linear Regression.

For every set of points (X_i, Y_i) we may fit a straight line or its approximate to help in predicting one variable from the other (X on Y or Y on X). That is, we wish to determine the fitted or predicted value of Y for a corresponding X, and equally the fitted or predicted value of X for a corresponding Y.

Thus, $$Y' = \alpha + \beta X$$

and $$X' = (Y - \alpha) \div \beta$$

The Residual Sum of Squares is calculated as follows:

$$RSS = \sum_{i=1}^{N} \{Y_i - (\alpha + \beta X_i)\}^2$$

The Pearson Correlation Coefficient (r) is calculated as follows:

$$r = \frac{N \sum_{i=1}^{N} X_i Y_i - \left(\sum_{i=1}^{N} X_i\right)\left(\sum_{i=1}^{N} Y_i\right)}{\left(\{N \sum_{i=1}^{N} X_i^2 - (N \sum_{i=1}^{N} X_i)^2\} \{N \sum_{i=1}^{N} Y_i - (\sum_{i=1}^{N} Y_i)^2\}\right)^{\frac{1}{2}}}$$

The means of $\overline{X}$ and $\overline{Y}$ are calculated respectively as follows:

$$\overline{X} = \left(\sum_{i=1}^{N} X_i\right) \div (N)$$

$$\overline{Y} = \left(\sum_{i=1}^{N} Y_i\right) \div (N)$$

The Standard Deviations of X (S_x) and Y (S_y) are calculated respectively as follows:

$$S_x = \{(\Sigma X_i^2 - N\overline{X}^2) \div (N - 1)\}^{\frac{1}{2}}$$

$$S_y = \{(\Sigma Y_i^2 - N\overline{Y}^2) \div (N - 1)\}^{\frac{1}{2}}$$

"t" is the student t-test and is calculated as follows:

$$t = r\{(N-2) \div (1-r^2)\}^{\frac{1}{2}}$$

P is the probability of obtaining a t this large or larger by chance

N is the number of subjects in the sample

TABLE 12

Statistical data generated from test performances of all students, passing or failing at MidTerm, in the control or treatment groups during the first and second halves of the semester.

GROUP:	(00) CONTROL		(11) SKILL-ANNOUNCED		(22) CHANCE-ANNOUNCED		(33) CHANCE-UNANNOUNCED		(44) SKILL-UNANNOUNCED	
SEMESTER:	1st half results	2nd half results	1st half results	2nd half results	1st half results	2nd half results	1st half results	2nd half results	1st half results	2nd half results
X =	68.16	66.58	69.19	69.58	69.97	71.00	69.42	72.42	69.91	75.15
SD =	10.50	12.22	9.42	8.78	8.72	9.75	10.97	9.55	14.59	9.78
N =	24	24	36	36	31	31	31	31	33	33
T =	2.178 (2-tailed)		0.430 (1-tailed)		1.112 (1-tailed)		1.773 (1-tailed)		3.260 (1-tailed)	
P =	0.05		----		----		0.05		0.005	

The use of the student "t" test in the analysis of data reported in Tables 12 thru 19 (pages 63-70) is warranted from the discussion advanced by Ferguson (1971; page 157). Essentially if one cannot assume that the population distributions from which the means are taken. are normal the t-test is still appropriate because as the N increases, such as in our data, the sampling distribution approximates a normal distribution.

TABLE 13

Statistical data generated from test performances of all students, passing at Mid Term in the control or treatment groups during the first and second halves of the semester.

GROUP:	(00) Control		(11) SKILL-ANNOUNCED		(22) CHANCE-ANNOUNCED		(33) CHANCE-UNANNOUNCED		(44) SKILL-UNANNOUNCED	
SEMESTER:	1st half results	2nd half results	1st half results	2nd half results	1st half results	2nd half results	1st half results	2nd half results	1st half results	2nd half results
X =	72.95	70.00	71.73	71.27	72.23	73.12	71.85	73.81	76.62	78.31
SD =	8.08	10.07	8.16	8.32	7.62	8.86	9.33	7.97	6.96	7.62
N =	19	19	30	30	26	26	26	26	26	26
T =	2.194 (2-tailed)		0.498 (1-tailed)		0.891 (1-tailed)		1.132 (1-tailed)		1.831 (1-tailed)	
P =	0.05		----		----		----		0.05	

TABLE 14

Statistical data generated from test performances of all students, failing at Mid Term, in the control or treatment groups during the first and second halves of the semester.

GROUP:	(00) CONTROL		(11) SKILL-ANNOUNCED		(22) CHANCE-ANNOUNCED		(33) CHANCE-UNANNOUNCED		(44) SKILL-UNANNOUNCED	
SEMESTER:	1st half results	2nd half results	1st half results	2nd half results	1st half results	2nd half results	1st half results	2nd half results	1st half results	2nd half results
$\bar{X}$ =	55.20	53.60	56.50	61.17	58.20	60.00	53.20	64.20	45.00	63.43
SD =	5.36	11.65	1.64	6.05	8.37	6.52	5.12	13.26	3.79	8.02
N =	5	5	6	6	5	5	5	5	7	7
T =	0.317 (1-tailed)		2.197 (1-tailed)		0.643 (1-tailed)		2.64 (1-tailed)		6.743 (1-tailed)	
P =	----		0.05		----		0.05		0.0005	

TABLE 15

Statistical data generated from test performances of all students, passing or failing at Mid Term, in the Announced Vs Unannounced or Skill vs Chance conditions during the first & second halves of the semester.

GROUP:	(11+22) ANNOUNCED		(33+44) UNANNOUNCED		(11+44) SKILL		(22+33) CHANCE	
SEMESTER:	1st half	2nd half	1st half	2nd half	1st half	2nd half	1st half	2nd half
$\bar{X}$ =	69.55	70.24	69.67	73.83	69.54	72.25	69.69	71.71
SD =	9.04	9.20	12.86	9.69	12.08	9.62	9.83	9.60
N =	67	67	64	64	69	69	62	62
T =	1.064 (1-tailed)		3.568 (1-tailed)		2.875 (1-tailed)		2.089 (1-tailed)	
P =	----		0.0005		0.005		0.025	

TABLE 16

Statistical data generated from test performances of all students, passing at Mid Term, in the Announced vs Unannounced or Skill vs Chance conditions during the first & second halves of the semester.

GROUP:	(11+22) ANNOUNCED		(33+44) UNANNOUNCED		(11+44) SKILL		(22+33) CHANCE	
SEMESTER:	1st half	2nd half	1st half	2nd half	1st half	2nd half	1st half	2nd half
$\bar{X}$ =	71.96	72.13	74.58	76.15	74.00	74.54	72.38	73.56
SD =	7.85	8.55	8.12	8.07	7.95	8.69	8.15	8.40
N =	56	56	52	52	56	56	52	52
T =	0.236 (1-tailed)		1.627 (1-tailed)		0.799 (1-tailed)		1.1[illegible]-tailed)	
P =	----		----		----		--	

TABLE 17

Statistical data generated from test performances of all students, failing at Mid Term, in the Announced vs Unannounced or Skill vs Chance conditions during the first & second halves of the semester.

GROUP:	(11+22) ANNOUNCED		(33+44) UNANNOUNCED		(11+44) SKILL		(22+33) CHANCE	
SEMESTER	1st half results	2nd half results	1st half results	2nd half results	1st half results	2nd half results	1st half results	2nd half results
$\bar{X}$ =	57.27	60.64	48.42	63.75	50.31	62.38	55.70	62.10
SD =	1.56	5.97	5.93	9.96	6.63	6.98	4.35	10.09
N =	11	11	12	12	13	13	10	10
T =	1.989 (1-tailed)		5.225 (1-tailed)		5.184 (1-tailed)		2.272 (1-tailed)	
P =	0.045		0.0005		0.0005		0.025	